

## Tunable Multiplexed Resonant Dipole Nanoantenna Array, Phase I

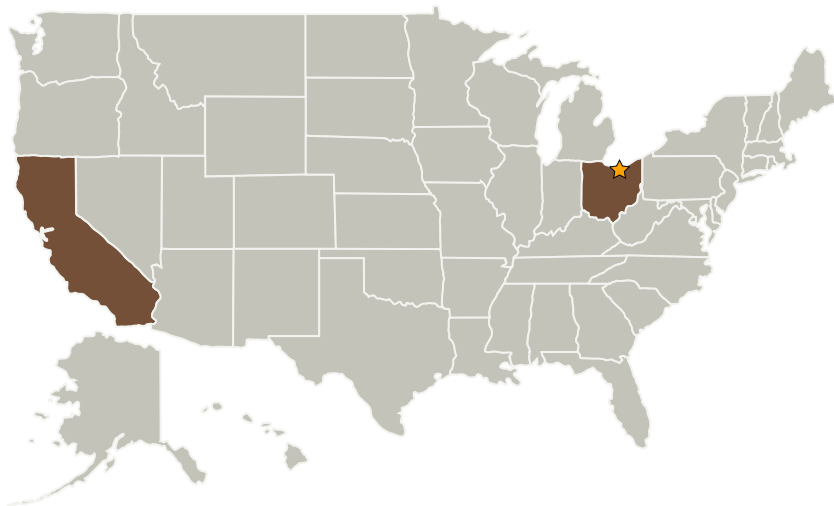
Completed Technology Project (2006 - 2006)



## Project Introduction

Radio frequency (RF) spectral density, instrument mass, and power considerations drive developments in construction of nanoscale features and terahertz, even petahertz frequencies. Tunable resonant nanostructures, capable of measurable interactions such as attenuation, polarizability, or re-radiation properties are necessary to investigate IR or optical wavelengths applications. Carbon nanotubes (CNT's) have material properties and dimensions that allow it to operate in the optical, and IR regimes. Ion flux molding (IFM) fabrication techniques enable assembly of conductive CNT structures with tunable EM response. The CNT structures are designed specifically to test the performance potential of nanoscale "thin-wire" antenna applications. Antenna performance metrics can be addressed by using IFM fabrication techniques on carbon nanotubes and nanotube arrays creating narrow band resonant dipole antennas. IFM fabrication techniques provide the ability to bend, mold, and configure an individual CNT or an array of CNTs to measure antenna properties such as the antenna length effect and the polarization effect. This will be accomplished through use of carbon nanotube (CNT) growth technology and microfabrication techniques combined with IFM molding processes to fabricate CNT antennas and antenna arrays. Ion Flux Molding (IFM) technology is the crucial element required to bend and mold the CNT into antenna morphologies.

## Primary U.S. Work Locations and Key Partners



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## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Center / Facility:**

Glenn Research Center (GRC)

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
modus nanotechnology	Supporting Organization	Industry	danville, California

## Primary U.S. Work Locations

California	Ohio
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## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

## Technology Areas

**Primary:**

- TX08 Sensors and Instruments
  - └ TX08.2 Observatories
    - └ TX08.2.2 Structures and Antennas